Remote user information for 19BM

Computer connections, time limits and operational notes

We recommend using a ThinLinc client for connecting: https://www.cendio.com/thinlinc/download. As you are a 19BM remote user, you will use the following computers:

		Computer time limits:
Data collection	pink.gp.sbc.aps.anl.gov	Terminated 1hr after data collection ends
Data transfer	rose.gp.sbc.aps.anl.gov	8 am on the following day after data collection ends
Data processing		
	gold.gp.sbc.aps.anl.gov	Terminated 1hr after data collection ends
Odd user account	magenta.gp.sbc.anl.gov	8 am on the following day after data collection ends
Even user account	red.gp.sbc.anl.gov	8 am on the following day after data collection ends

Local accounts are not activated before 9:30 am on the day of beam time and beam time does not start until you have contacted your host and covered all relevant safety items and the pucks are loaded. Due to potential conflicts with multiple users operating the robot, users are requested not to operate any beamline hardware, **especially the robot**, until the host has cleared you to take control.

Please note that pink and gold have time limitations due to their local proximity during data collection. Access to these machines will be abruptly terminated 1 hour after your beam time ends. However, all data will still be accessible on the post processing computers. For user accounts with odd or even numbers e.g., user21bm for an odd account, the computers listed above will be accessible for an additional 24hr period passed the end of data collection i.e., 8am the following day. Please make sure your backups are completed before the time limit is up. The data will remain on the local disk for two weeks but remain inaccessible unless done through special request for extra time via Michelle Radford. After two weeks the data will be deleted permanently with no possibility of recovery.

Data backup

Linux and Macintosh OS X have ssh clients built-in and can run an SBC-provided script called RemoteBackupScript.csh to perform the backup. Instructions for using this script are given in Using Remote Backup Script. See the SBC website for details under Data Backups.

Beamline characteristics

Photon flux at 12.66keV	~1.6 x 10^{11} ph/sec
Approx. beam size at sample	50 x 50µm^2 (not adjustable by user)
Minimum det dist	~125mm
Maximum det dist	250mm (suggested) without special assistance due to beam divergence
Omega range	± 120 deg
Energy range (staff assist. req)	6.1-13.5keV
Robot	Unipucks, ALS pucks only, Rigaku pucks not allowed.
Robot drying cycle	Automatic after every 16 mounts; cycle time ~4min

See SBC website www.sbc.anl.gov for more details regarding robot pins and other useful information.

19BM Beamline phones: 630-252-9833 land line
630-252-0568 portable

For general questions regarding your visit or if your account needs to be extended for data processing please contact Michelle Radford 1-630-252-0560 / mficner@anl.gov.

For all other computing issues, please contact Krzysztof Lazarski 1-630-252-3855 / lazarski@anl.gov.

For safety issues, please contact Norma Duke 1-630-252-3850 / duke@anl.gov.

For general beamline questions during operations, please contact your host. For beamline specifics in advance of your visit, contact Randy Alkire 1-630-252-3865 / alkire@anl.gov.

To bring up individual toolbars after logging in (see screenshots below)

SBC User 19-BM (red) toolbar used to launch al programs

From a terminal window, at the prompt type “SBCTOOLS” and hit return

SBCCollect

From the **SBC User 19-BM** toolbar click the “sbccollect” button; from the menu screen launched, click “sbccollect”

Robot screen

From the SBCCollect screen at the top of the menu tab next to File, click Operator → Robot

19BM Setup for High/Low Energy Operation

This is the screen used to align the guard-slit and goniostat positions when optimizing the beam position.

From the **SBC User 19-BM** toolbar click “Beamline” → at the bottom of the menu list click “High/Low Energy Operation”

Fast X-ray Shutter and Attenuator screen

From the **SBC User 19-BM** toolbar click on “Beamline” → “Timing Shutter/Attenuators…”

19bm-BPMs.adl …… This is the Tuning screen.

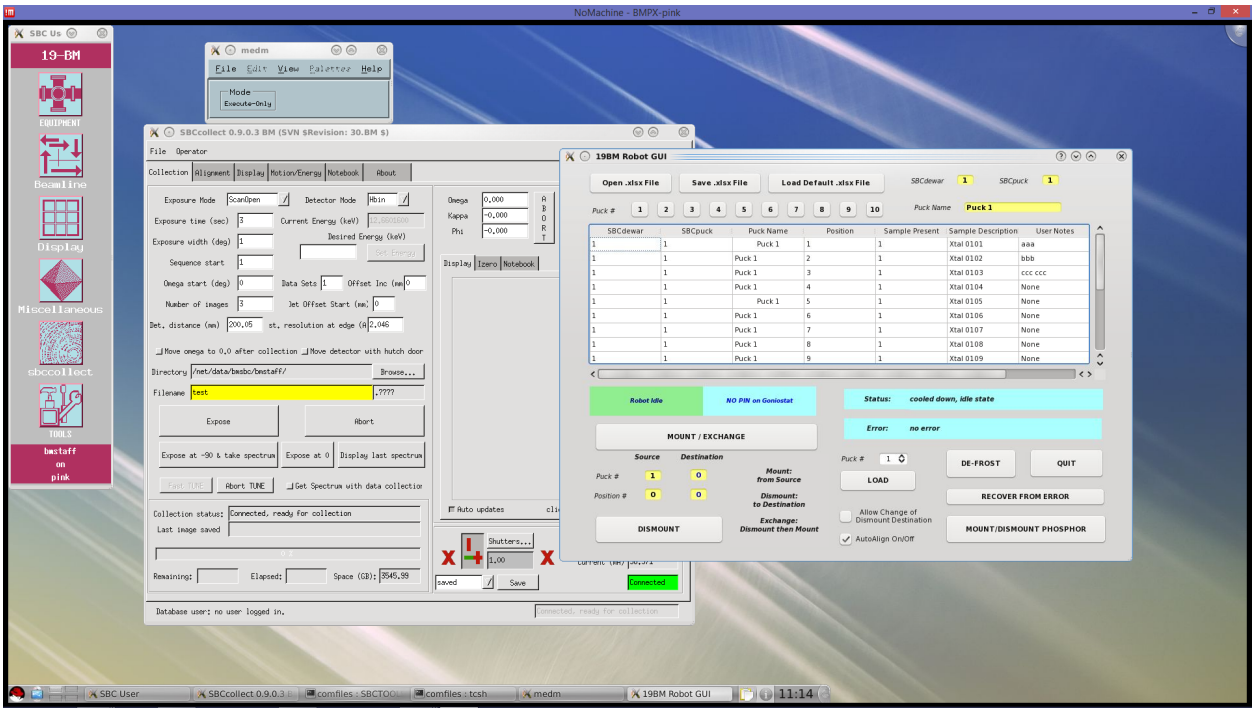
From the small grey MEDM toolbar which launches with the SBCTOOLS toolbar, click File → Open → select “19BM-BPMs.adl → click OK

In case the default directory is incorrect, the full path for this screen is
(/net/prog1/comfiles/19BM-BPMs.adl).

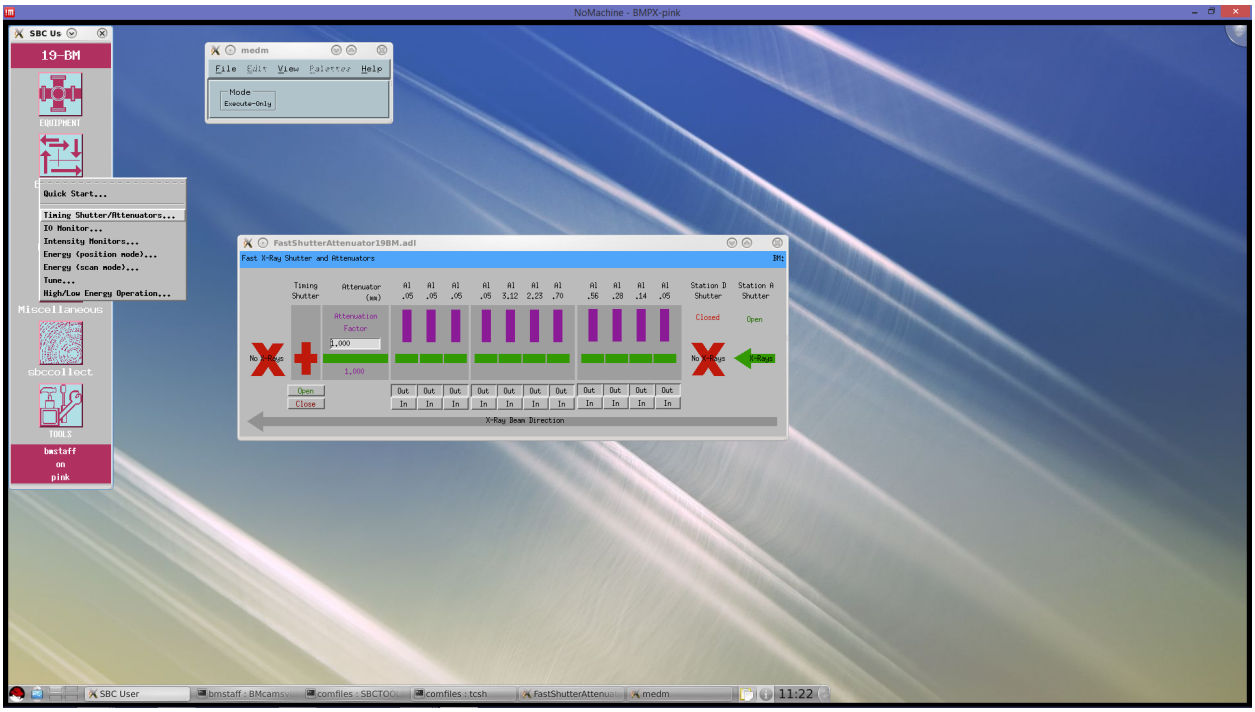
BMcamsview.sh … the multi-camera view screen.

To bring up the multi-view window which shows the robot camera and all three of the sample cameras.

At the prompt from a terminal window type: BMcamsview.sh (then hit return)



SBCcollect main data collection screen along with the 19BM Robot GUI. From the SBCCollect screen at the top of the menu tab next to File, click Operator → Robot to bring up the robot gui. Note the Mount/Dismount Phosphor button in the lower right hand corner of the robot gui.



View of the FastShutterAttenuator screen and how to get it by clicking the Beamline button followed by clicking the Timing Shutter/Attenuators line.

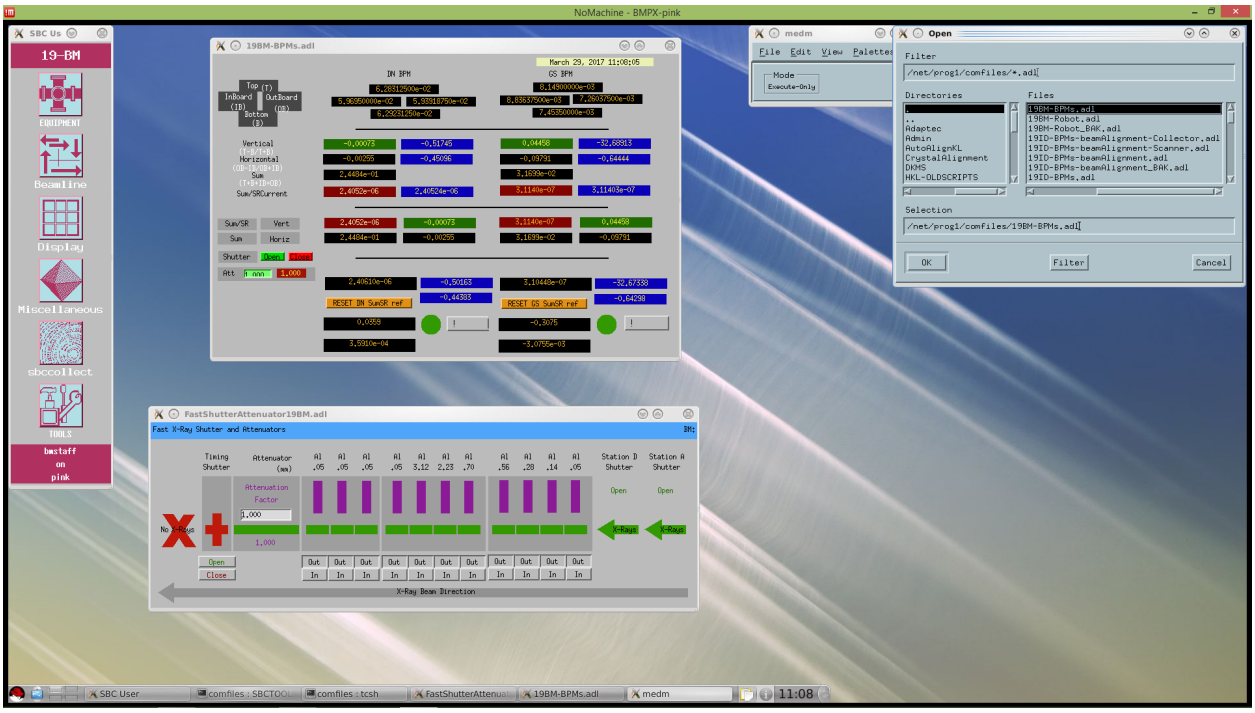
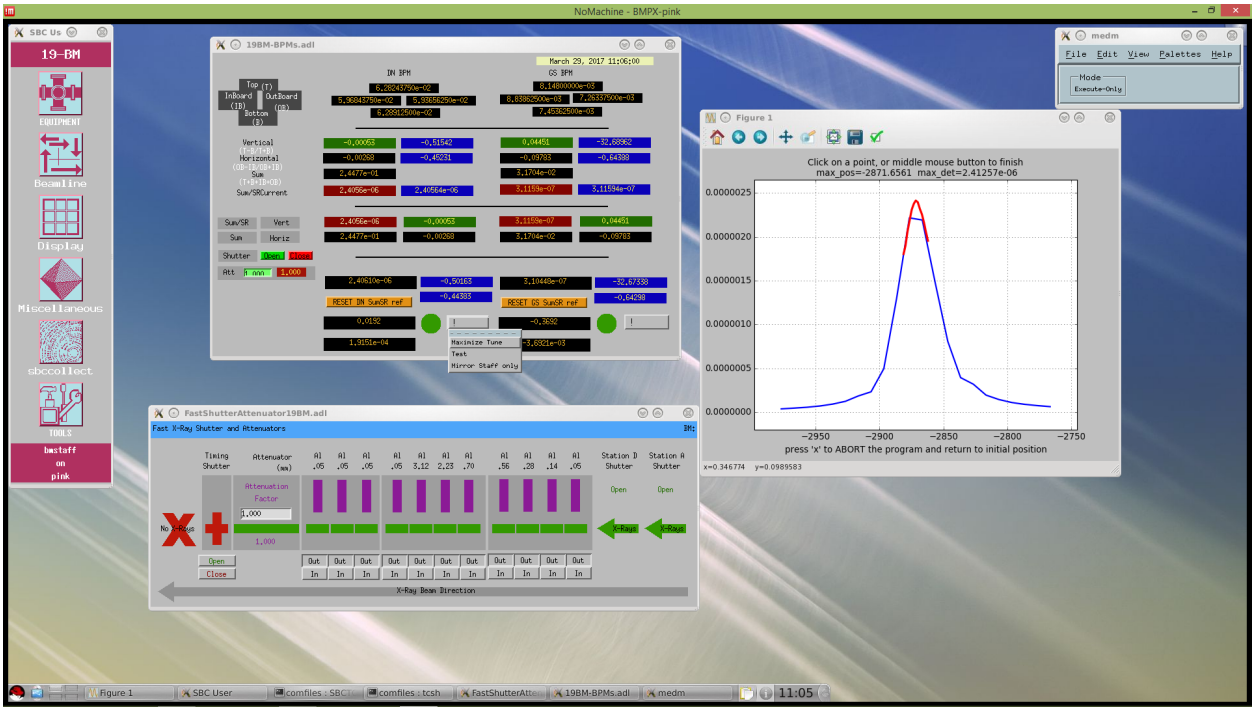
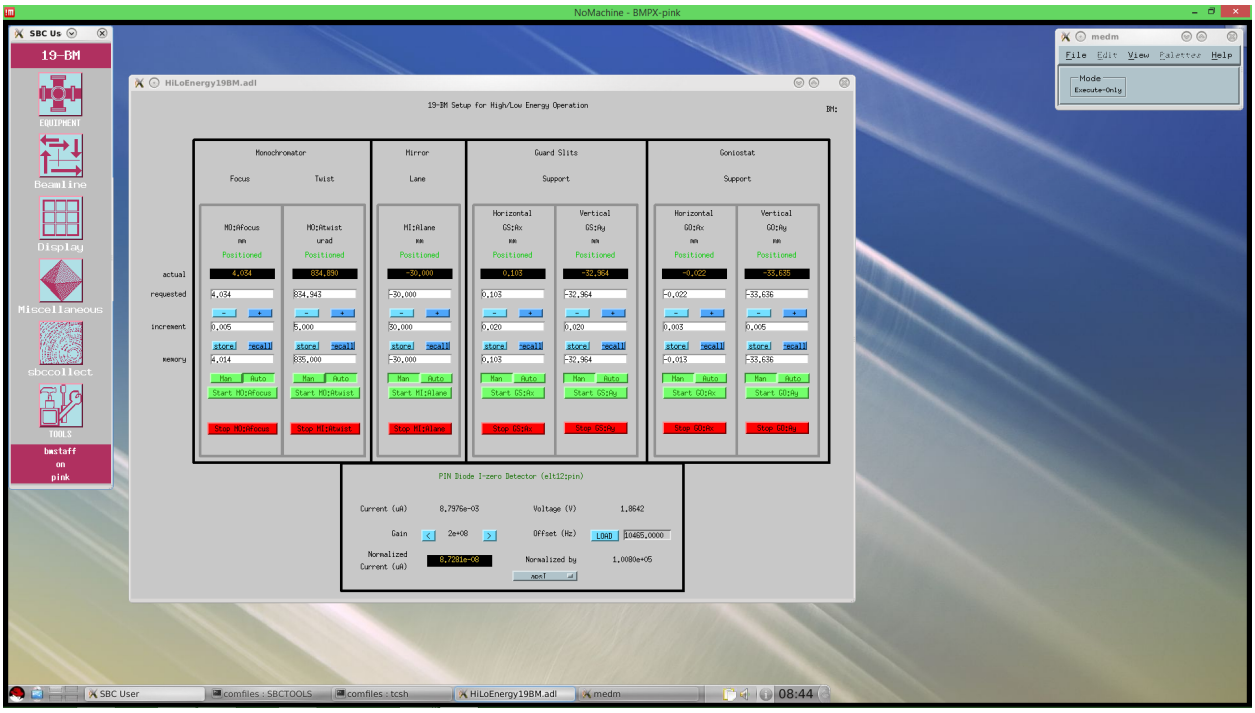


Image of 19BM-BPMs.adl tuning screen. From the small grey MEDM toolbar you go to File → Open (/net/prog1/comfiles/*.adl) and select the 19BM-BPMs.adl file to bring up the tuning screen as shown.



This is an image of the 19BM-BPMs.adl tuning screen showing which button to push to get the Maximize Tune program. After execution, the two color plot is generated; blue for a coarse scan and red for a fine scan. Note that no attenuators are inserted during tuning. The circle next to the tune selection button should be green after tuning. If this button turns yellow, the tune should be repeated. The second green circle and the button next to it on the far right should be ignored.



View of the High/Low Energy Operation screen.

Screen showing phosphor mounted in correct position on the SBCCollect-Alignment tab. Note the position of the crosshairs relative to the on-axis camera (right screen). To visualize the crosshair push the Top camera button to get that light to turn on. The 19BM video streams are visible once the BMcamsview.sh screen is setup. The ***shutter must be opened manually*** to

allow beam to pass onto the phosphor. This image shows the shutter open to visualize the beam and an attenuator in place to lower blooming of the image on the phosphor; this helps define the beam position. After setting the beam position to the crosshair center by hitting the increment buttons on the Horizontal (GO:Ax) and Vertical (GO:Ay) columns (far right) in the High/Low Energy screen, the ***shutter must be closed manually.*** A full procedure is listed below on how to check the beam position.

Procedure for checking/aligning the beam position at 19BM

Note: Only SBC staff can change the energy on 19BM, including the monochromator focus and twist. Please do not attempt this.

Mounting the phosphor to check the beam position (first step) –

(screens required -- **SBC User 19-BM toolbar,** SBCCollect, Robot screen and BMcamsview.sh)

1. Dismount any sample before starting the procedure
2. Mount the phosphor with the robot by clicking the Mount/Dismount phosphor button.
3. Make sure the "dark" area of the phosphor is centered on the crosshairs as seen by the on-axis camera (lower right image). Use point and click to align the dark area if necessary.

Procedure for setting the beam to the rotation axis (tune and alignment after mounting the phosphor) –

(screens required -- **SBC User 19-BM toolbar, MEDM toolbar,** 19BM-BPMs.adl, Fast X-ray Shutter and Attenuator, 19BM Setup for High/Low Energy Operation and BMcamsview.sh)

4. Locate the 19BM-BPMs.adl screen
5. In the center of the screen near the bottom, below the DN BPM column, click on the button with an ! mark. On the top of the screen it launches is the "Maximize Tune" button – click on this to initiate a monochromator tune. A tune screen will be launched and two tune scans will be started; one coarse (blue) and one fine (red).
6. When the red scan is completed, use the center mouse button and click on the tune graph to delete it.
7. With no attenuators in (attenuation factor 1), click on the orange "Reset DN SumSR ref" button near the bottom of the DN BPM column, just to the left of the tune button. This will reset the reference indicator positions to zero and the adjacent colored circle will turn green. If/when the colored circle turns yellow, you will need to re-tune.
8. From the Fast X-ray Shutter and Attenuator screen, Click "Open" to manually open the timing-shutter. Observe the beam position on the phosphor relative to the crosshair center. Put attenuators in as needed until a clear image of the focused beam can be seen. At 12.66keV, this requires about a factor of 8 attenuation, roughly equivalent to the 0.56mm Al attenuator. If the beam shape does not look right, notify staff. **Do not adjust the beam focus or twist.**
9. From the 19BM Setup for High/Low Energy Operation screen, locate the Goniostat Support motions (far right). With the motors in "Auto" mode, click the increment buttons (with the increment set to 0.005 typically) to drive the image of the beam on the phosphor to the center of the crosshairs. Make sure you can clearly see where the **center** of the crosshairs are (the center of the box) before beginning.
10. When completed, return the Goniostat Support motions to their "Man" (manual) position.
11. On the Fast X-ray Shutter and Attenuator screen, Click "Close" to manually close the timing-shutter. Remove all attenuators.
12. Dismount the phosphor using the robot.